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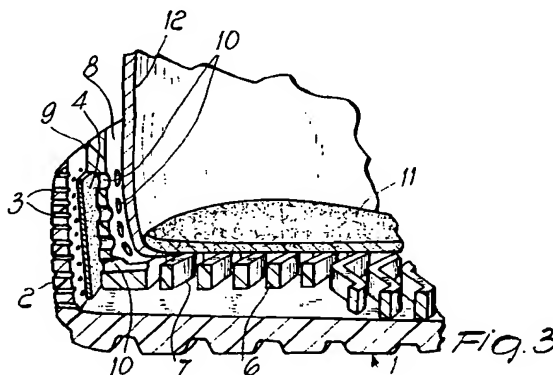
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(54) **Waterproof and transpiring outsole.**

(57) The waterproof and transpiring outsole which is particularly useful for footgear comprises at least one outer band (2), made of rubber or of an equivalent material, the thickness whereof is crossed by microperforations (3). The outer band is coupled, with the interposition of a membrane (4) made of transpiring and waterproof material, to a corresponding inner band (8), also made of rubber or of an equivalent material. The inner band is crossed by holes (10) which communicate with the inside of the item of footgear.



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The present invention relates to a waterproof and transpiring outsole which is particularly useful in many types of footwear.

Footgear with outsoles made of synthetic material or rubber is currently in widespread use and, although it has considerable advantages from point of view of production and economy as well as in terms of practicality in use, are affected by the disadvantage that the outsole of the foot is not allowed to transpire outward through them at all.

This causes discomfort to the user or even the so-called "athlete's foot".

An outsole in which a transpiring and waterproof membrane is interposed between a tread provided with microperforations and an upper part provided with holes has thus been provided for this reason.

Although it is optimum for the transpiration of the foot, said outsole has been found to be affected by other disadvantages, the most significant of which is due to the fact that the microperforations of the tread are subject to rapid clogging, thus limiting or even inhibiting the flow of air.

The aim of the present invention is to provide an outsole which solves the disadvantage described above in the known art.

A consequent primary object is to provide an outsole which has the same advantages as those currently commercially available.

Another object is to provide an outsole which can be manufactured at low cost and can thus be marketed at a competitive price.

Not least object is to increase comfort for the user.

This aim, these objects and others which will become apparent hereinafter are achieved by a waterproof and transpiring outsole, as defined in the appended claims.

Further characteristics and advantages of the invention will become apparent from the detailed description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of the outsole according to the invention;

figure 2 is a sectional perspective detail view of the outsole of figure 1 in combination with an upper and inner sole of a shoe structure;

figure 3 is a sectional view of the detail of figure 2.

With reference to the above figures, the outsole according to the invention comprises a tread 1, made of rubber or of an equivalent material, from which two outer bands 2 extend upward perimetrically, are monolithic with the remainder and are provided with microperforations 3 which cross their thickness.

Conveniently, said microperforations 3 can be

arranged on all or part of the extension of each outer band 2.

A transpiring and waterproof membrane 4 is arranged, according to the invention, inside each outer band 2 and is preferably constituted by a material such as the one commonly termed by the trademark GORE-TEX or by another equivalent material.

The outsole furthermore comprises a foot supporting part 5, made of rubber or of an equivalent material, which is assembled to the tread 1, forming a single unit.

Advantageously, said foot supporting part 5 comprises a grid of transverse partitions 6 which are separated by grooves 7 and extends perimetrically with a band 8 which is internal to the preceding ones 2 in the regions occupied thereby and is coupled thereto in the regions of the edges 9.

Said inner band 8 is crossed, in the regions in which it is superimposed on the bands 2, by holes 10 which eventually communicate with the inside of the item of footwear.

Said holes 10 are arranged so as to be also connected to said grooves 7, so as to allow the flow of air arriving from the foot outsole region as well.

Said region is therefore connected to the outside by means of the holes 10, the membrane 4 and the microperforations 3.

In combining the outsole in use with footwear, a transpiring insole 11 is arranged above the part 5, and an upper 12, made of transpiring material, is fixed inside the band 8 for example by means of stitches.

At this point the fact should be stressed that during assembly no adhesive or other material must affect the regions provided with the microperforations 3, with the holes 10 and the regions occupied by the membrane 4.

It should be furthermore noted that the tread 1, with the outer bands 2, and the foot supporting part 5, with the inner band 8, must be assembled so as to ultimately form a single unit, preventing water from seeping through the joints.

An example of the technology which can be used to manufacture the outsole according to the invention is given by injection-molding.

In the end, the structure is completely waterproof both in its lower part and in its lateral band region, in which transpiration is in any case allowed as indicated by the arrows shown in the drawing.

Since the microperforations are arranged on the outer bands 2, they are not subject to easy clogging and the disadvantage which affects known transpiring and waterproof outsoles is thus overcome.

It should be furthermore noted that while walking, the foot subjects the partitions 6 to alternating

compressions and expansions, obtaining, in the regions in which the grooves 7 are connected to the holes 10, a sort of pumping effect, drawing in outside air and forcing out the air which is contained inside the item of footgear, which contains sweat and moisture.

Transpiration is thus improved also by this mechanical effect caused by the foot, and the membrane 4 assumes the function of a sort of nonreturn valve for the moisture expelled outward through it.

In practice it has thus been observed that the invention has achieved the intended aim and objects.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, so long as compatible with the contingent use, as well as the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

### Claims

1. Waterproof and transpiring outsole, characterized in that it comprises at least one outer band (2), made of rubber or of an equivalent material, which is provided with microperforations (3) which pass through its thickness, said band being coupled, with the interposition of a membrane (4) made of a transpiring and waterproof material, to a corresponding inner band (8), made of rubber or of an equivalent material, which is crossed by holes (10) connectable to the inside of the item of footgear.
2. Outsole according to claim 1, characterized in that said holes (10) of the inner band (8) are connectable to the inside of the item of footgear in the foot sole region as well.
3. Outsole according to claim 1, characterized in that said perimetric outer band (2) is monolithic with the tread (1).
4. Outsole according to claim 1, characterized in that said inner band (8) is monolithic with the foot supporting part (5) of the outsole.

5. Outsole according to one or more of the preceding claims, characterized in that said tread (1), with the related outer band (2), and the foot supporting part (5), with the related inner band (8), are externally associated with the membrane (4), forming a single unit with no outward openings.
6. Outsole according to one or more of the preceding claims, characterized in that said foot supporting part (5) comprises transverse and/or longitudinal partitions (6) which are separated from one another by grooves (7), said grooves being connected to part of the holes (10) of said inner band (8).
7. Outsole according to one or more of the preceding claims, characterized in that said microperforations (3) and said holes (10) are arranged at one another and extend along the entire extension of the respective bands (2,8) or only on part thereof.
8. Outsole according to one or more of the preceding claims, characterized in that said inner band (8) is suitable for being associated with the lower part of a transpiring upper (12), for example by means of stitches.
9. Outsole according to one or more of the preceding claims, characterized in that said membrane (4) made of transpiring and waterproof material is constituted by the material commonly termed by the trademark GORE-TEX or by an equivalent material.

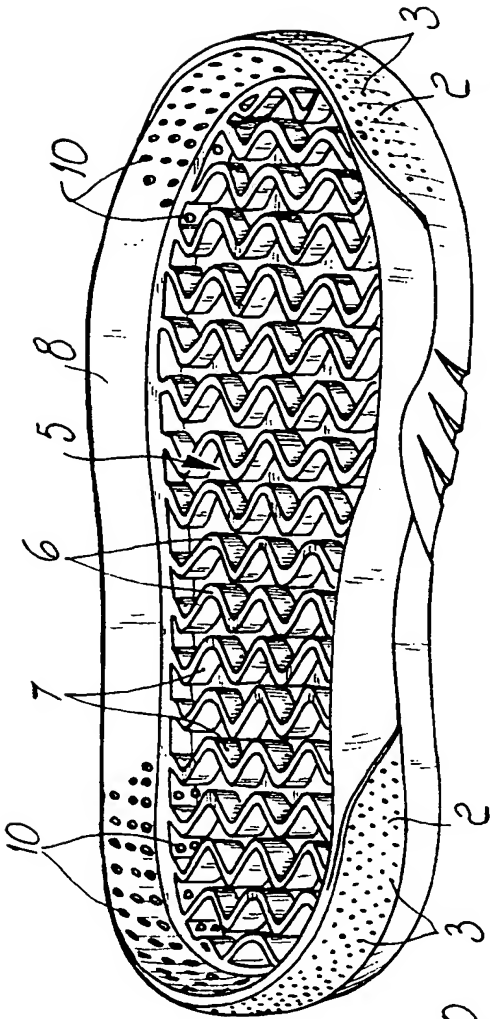


Fig. 1

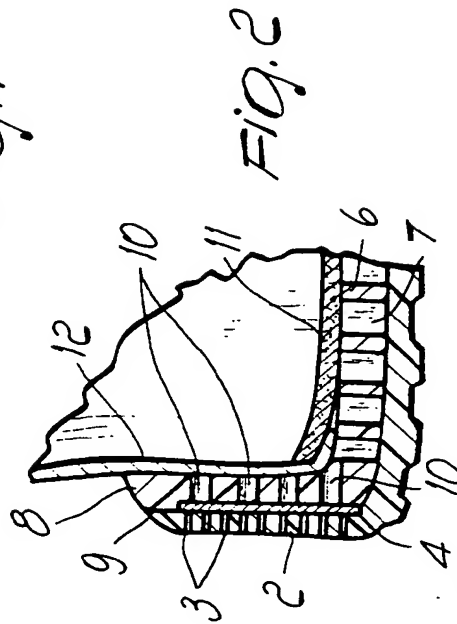


Fig. 2

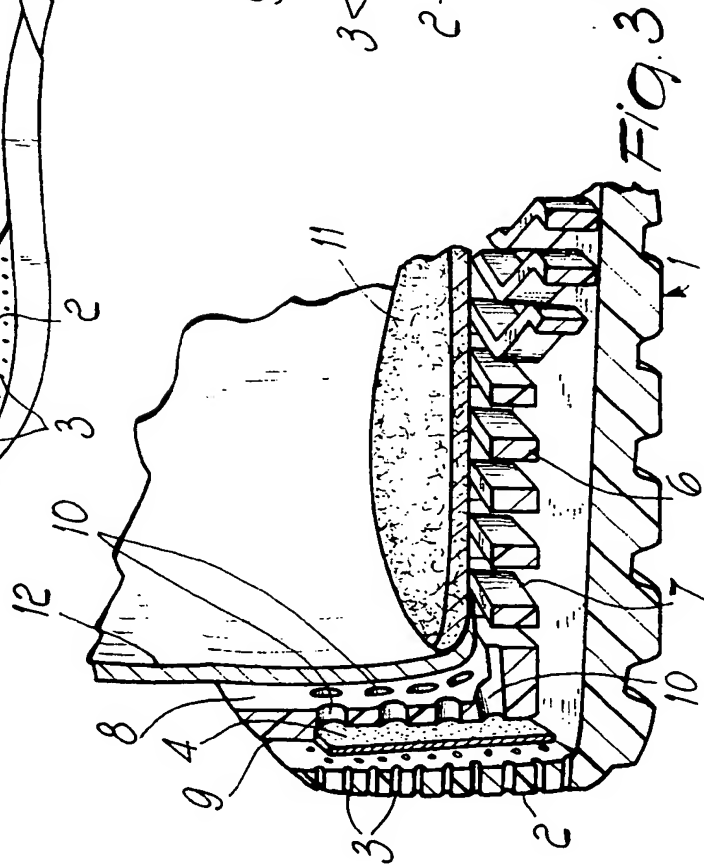


Fig. 3

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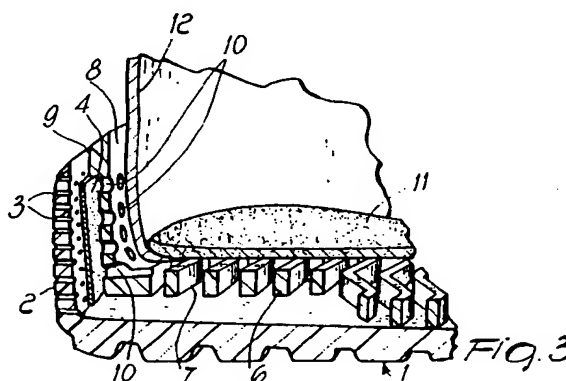
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## EUROPEAN SEARCH REPORT

Application Number

EP 91 11 6638

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	FR-A-2 116 790 (SOCIÉTÉ LABELLE & CIE) * the whole document * ---	1-9	A43B13/12 A43B7/06
Y	GB-A-472 955 (U.S. RUBBER PRODUCTS INC.) * the whole document * ---	1-9	
Y	EP-A-0 103 061 (OHASHI) * abstract; figures 4,5 * ---	1-9	
Y	GB-A-975 740 (SOCIETE TH. GRIMMEISEN) * the whole document * ---	1-9	
Y	EP-A-0 382 904 (POL SCARPE SPORTIVE S.R.L.) * the whole document * ---	1-9	
Y	DE-U-8 716 069 (GYÖRGY) * the whole document * ---	1-9	
A	US-A-4 599 810 (SACRE) * the whole document * ---	1-9	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	DE-A-3 840 263 (ADIDAS AG) -----	1-9	A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06 OCTOBER 1992	Examiner MATHEY X.C.M.
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

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